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10/591,248

11/27/2006

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EXAMINER

SHEN, WU CHENG WINSTON

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1632

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/591,248	Applicant(s) OKUBO ET AL.	
	Examiner WU-CHENG Winston SHEN	Art Unit 1632	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 1 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-36 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☐ Claim(s) ____ is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☒ Claim(s) 1-36 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

1. The claim amendments filed on 08/31/2008 have been entered. Claims 7-10, 17, 22-26, 28-33, and 36 are amended. Claims 1-36 are pending in the instant application.

Election/Restrictions

2. Restriction is required under 35 U.S.C. 121 and 372.

This application contains the following inventions or groups of inventions, which are not so linked as to form a single general inventive concept under PCT Rule 13.1.

In accordance with 37 CFR 1.499, applicant is required, in reply to this action, to elect a single invention to which the claims must be restricted.

- I. Claims 1, 7-11, 17, drawn to a uracil-requiring gene-disrupted yeast wherein URA3 gene of chromosomal DNA is disrupted by the homologous recombination with a URA3 DNA fragment.
- II. Claims 2, 12, drawn to a histidine-requiring gene-disrupted yeast wherein HIS5 gene of chromosomal DNA is disrupted by the homologous recombination with an HIS5 DNA fragment.
- III. Claims 3, 13, drawn to an adenine- and uracil-requiring gene-disrupted yeast wherein ADE1 gene and URA3 gene of chromosomal DNA are disrupted by the homologous recombination with an ADE1 DNA fragment and URA3 DNA fragment.

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- IV. Claims 4, 14, drawn to an adenine- and histidine-requiring gene-disrupted yeast wherein ADE1 gene and HIS5 gene of chromosomal DNA are disrupted by the homologous recombination with an ADE1 DNA fragment and HIS5 DNA fragment.
- V. Claims 5, 15, drawn to a uracil- and histidine-requiring gene-disrupted yeast wherein URA3 gene and HIS5 gene of chromosomal DNA are disrupted by the homologous recombination with a URA3 DNA fragment and HIS5 DNA fragment.
- VI. Claim 6, 16, drawn to an adenine-, uracil- and histidine-requiring gene-disrupted yeast wherein ADE1 gene, URA3 gene and HIS5 gene of chromosomal DNA are disrupted by the homologous recombination with an ADE1 DNA fragment, URA3 DNA fragment and HIS5 DNA fragment.
- VII. Claims 18 and 19, drawn to a process for producing a gene expression product which comprises harvesting an expression product of an isogene or heterogene from a cultured product obtainable by culturing the transformant according to claim 17.
- VIII. Claims 20-25, drawn a yeast transformant which is introduced with a polyhydroxyalkanoic acid synthase gene, and the gene being introduced in 2 or more copies.
- IX. Claims 20-25, drawn a yeast transformant which is introduced with an acetoacetyl CoA reductase gene, and the gene being introduced in 2 or more copies.

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- X. Claims 20-25, drawn a yeast transformant which is introduced with a polyhydroxyalkanoic acid synthase gene and an acetoacetyl CoA reductase gene, and both of these genes being introduced in 2 or more copies.
- XI. Claims 26 and 27, drawn to a yeast transformant which is introduced with a polyhydroxyalkanoic acid synthase gene, and the gene being introduced in 2 or more copies, wherein the polyhydroxyalkanoic acid synthase gene codes for an enzyme or mutant derived from *Aeromonas caviae* having the amino acid sequence shown under SEQ ID No: 5.
- XII. Claims 26 and 27, drawn to a yeast transformant which is introduced with a polyhydroxyalkanoic acid synthase gene and an acetoacetyl CoA reductase gene, and both of these genes being introduced in 2 or more copies, wherein the polyhydroxyalkanoic acid synthase gene codes for an enzyme or mutant derived from *Aeromonas caviae* having the amino acid sequence shown under SEQ ID No: 5.
- XIII. Claim 28, drawn to a yeast transformant which is introduced with an acetoacetyl CoA reductase gene, and the gene being introduced in 2 or more copies, wherein the acetoacetyl CoA reductase gene codes for an enzyme or mutant derived from *Ralstonia eutropha* having the amino acid sequence shown under SEQ ID NO: 6.
- XIV. Claim 28, drawn a yeast transformant which is introduced with a polyhydroxyalkanoic acid synthase gene and an acetoacetyl CoA reductase gene, and both of these genes being introduced in 2 or more copies, wherein the

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acetoacetyl CoA reductase gene codes for an enzyme or mutant derived from *Ralstonia eutropha* having the amino acid sequence shown under SEQ ID NO: 6.

- XV. Claims 29, drawn to a yeast transformant which is introduced with a poly-hydroxyalkanoic acid synthase gene, and the gene being introduced in 2 or more copies, wherein the polyhydroxyalkanoic acid is a copolymer obtainable by copolymerizing 3-hydroxyalkanoic acid represented by the general formula (1).
- XVI. Claims 29, drawn to a yeast transformant which is introduced with a polyhydroxyalkanoic acid synthase gene and an acetoacetyl CoA reductase gene, and both of these genes being introduced in 2 or more copies, wherein the polyhydroxyalkanoic acid is a copolymer obtainable by copolymerizing 3-hydroxyalkanoic acid represented by the general formula (1).
- XVII. Claim 30, drawn to a yeast transformant which is introduced with a poly-hydroxyalkanoic acid synthase gene, and the gene being introduced in 2 or more copies, wherein the polyhydroxyalkanoic acid is a copolyester obtainable by copolymerizing 3-hydroxybutyric acid represented by the following general formula (2) and 3-hydroxyhexanoic acid represented by the following general formula (3).
- XVIII. Claims 30, drawn to a yeast transformant which is introduced with a polyhydroxyalkanoic acid synthase gene and an acetoacetyl CoA reductase gene, and both of these genes being introduced in 2 or more copies, wherein the polyhydroxyalkanoic acid is a copolyester obtainable by copolymerizing 3-

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hydroxybutyric acid represented by the following general formula (2) and 3-hydroxyhexanoic acid represented by the following general formula (3).

- XIX. Claim 31, drawn to a process for producing a polyester using a yeast transformant which is introduced with a polyhydroxyalkanoic acid synthase gene, and the gene being introduced in 2 or more copies, which comprises harvesting a polyester from a cultured product obtainable by culturing said yeast transformant.
- XX. Claim 31, drawn to a process for producing a polyester using a yeast transformant which is introduced with an acetoacetyl CoA reductase gene, and the gene being introduced in 2 or more copies, which comprises harvesting a polyester from a cultured product obtainable by culturing said yeast transformant.
- XXI. Claim 31, drawn to a process for producing a polyester using a yeast transformant which is introduced with a polyhydroxyalkanoic acid synthase gene and an acetoacetyl CoA reductase gene, and both of these genes being introduced in 2 or more copies, which comprises harvesting a polyester from a cultured product obtainable by culturing said yeast transformant.
- XXII. Claim 32, drawn to a method for controlling the molecular weight of a polyester in producing a polyester using a yeast transformant which is introduced with an acetoacetyl CoA reductase gene, and the gene being introduced in 2 or more copies, which comprises controlling the number of acetoacetyl CoA reductase gene in the yeast transformant.
- XXIII. Claim 32, drawn to a method for controlling the molecular weight of a polyester in producing a polyester using a yeast transformant which is introduced with a

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polyhydroxyalkanoic acid synthase gene and an acetoacetyl CoA reductase gene, and both of these genes being introduced in 2 or more copies, which comprises controlling the number of acetoacetyl CoA reductase gene in the yeast transformant.

XXIV. Claim 33, drawn to a method for controlling a hydroxyalkanoic acid composition of a polyester in producing a polyester using a yeast transformant which is introduced with a polyhydroxyalkanoic acid synthase gene, and the gene being introduced in 2 or more copies, which comprises controlling the number of a polyhydroxyalkanoic acid synthase gene in the yeast transformant.

XXV. Claim 33, drawn to a method for controlling a hydroxyalkanoic acid composition of a polyester in producing a polyester using a yeast transformant which is introduced with a polyhydroxyalkanoic acid synthase gene and an acetoacetyl CoA reductase gene, and both of these genes being introduced in 2 or more copies, which comprises controlling the number of a polyhydroxyalkanoic acid synthase gene in the yeast transformant.

XXVI. Claims 34-36, drawn a method for recovering a selective marker which comprises carrying out the intramolecular homologous recombination in *Candida maltosa* having ADE1 gene as a selective marker gene to remove said ADE1 gene.

The claims are further restricted.

(i) Claim 7 of Group I is drawn to multiple genus of yeast and a specific genus of yeast must be elected. The multiple genus of yeast lack unity of invention because “special technical

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feature” for construction of transformed yeasts belong to different genus is distinct from one genus of yeast to another genus of yeast, and the intrinsic characteristic of yeasts of different genus are distinct. This is not a requirement for election of species.

(ii) Claim 27 of Groups XI-XII is drawn multiple mutated polyhydroxyalkanoic acid synthase genes encoding polyhydroxyalkanoic acid synthases with various amino acid substitutions. Either a specific amino acid substitution of (a) to (h), or specific combination of amino acid substitutions of (a) to (h), must be elected. The multiple amino acid substitutions lack unity of invention because “special technical feature” for one amino acid substitution is distinct one from another amino acid substitution in terms of the chemical structure of the amino acids and the effect of various amino acid substitutions on the polyhydroxyalkanoic acid synthases structure. This is not a requirement for election of species.

3. The inventions listed as Groups I-XXVI do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons:

Applicant’s claims encompass multiple inventions, multiple products (various yeast transformants) and multiple methods (methods of making and methods of using the products), and do not have a special technical feature which link the inventions one to the other, and lack unity of invention. The common technical feature in all groups is a yeast transformant.

However, this common technical feature cannot be a special technical feature under PCT Rule 13.2 because the feature is shown in the prior art. **Remacha et al.** teaches that by gene disruption techniques with linearized DNA from these constructions, strains of *Saccharomyces*

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cerevisiae were obtained which lacked a functional gene for either protein L44 or protein L45.

The disrupted genes in the transformants were characterized by Southern blots (See abstract,

Remacha et al. Disruption of single-copy genes encoding acidic ribosomal proteins in *Saccharomyces cerevisiae*, *Mol Cell Biol.* 10(5):2182-90, 1990).

4. This application contains claims directed to more than one species of the generic invention. These species are deemed to lack unity of invention because they are not so linked as to form a single general inventive concept under PCT Rule 13.1.

The species are as follows: *aibicans* species, *ancudensis* species, *atmosphaerica* species, *azyma* species, *bertae* species, *blankii* species, *butyri* species, *conglobata* species, *dendronema* species, *ergastensis* species, *fluviatilis* species, *friedrichii* species, *gropengiesseri* species, *haemulonii* species, *incommunis* species, *insectrum* species, *laureliae* species, *maltosa* species, *melibiosica* species, *membranifaciens* species, *mesenteriea* species, *natalensis* species, *oregonensis* species, *palmioleophila* species, *parapsilosis* species, *pseudointermedia* species, *quercitrusa* species, *rhagii* species, *rugosa* species, *saitoana* species, *sake* species, *schatavii* species, *sequanensis* species, *shehatae* species, *sorbophila* species, *tropicalis* species, *valdiviana* species, and *viswanathii* species of the genus *Candida* (claim 9). The following claim(s) are generic: claim 1.

The species listed above do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, the species lack the same or corresponding special technical features for the following reasons: they are distinct species of yeast belong to the genus

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Candida that have different genomic composition and distinct pathological characteristics upon infection to a host.

Applicant is required, in reply to this action, to elect a single species to which the claims shall be restricted if no generic claim is finally held to be allowable. The reply must also identify the claims readable on the elected species, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered non-responsive unless accompanied by an election.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which are written in dependent form or otherwise include all the limitations of an allowed generic claim as provided by 37 CFR 1.141. If claims are added after the election, applicant must indicate which are readable upon the elected species. MPEP § 809.02(a).

MPEP 1893.03(d) Unity of Invention Rejoinder

5. MPEP 1893.03(d) states: If an examiner (1) determines that the claims lack unity of invention and (2) requires election of a single invention, when all of the claims drawn to the elected invention are allowable (i.e., meet the requirements of 35 U.S.C. 101, 102, 103 and 112), the nonelected invention(s) should be considered for rejoinder. Any nonelected product claim that requires all the limitations of an allowable product claim, and any nonelected process claim that requires all the limitations of an allowable process claim, should be rejoined. See MPEP § 821.04 and § 821.04(a). Any nonelected processes of making and/or using an allowable product should be considered for rejoinder following the practice set forth in MPEP § 821.04(b).

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6. Because these inventions are independent or distinct for the reasons given above and there would be a serious burden on the examiner if restriction were not required because the inventions require a different field of search (see MPEP § 808.02), restriction for examination purposes as indicated is proper.

Applicant is advised that the reply to this requirement to be complete must include (i) an election of a species or invention to be examined even though the requirement be traversed (37 CFR 1.143) and (ii) identification of the claims encompassing the elected invention.

The election of an invention or species may be made with or without traverse. To reserve a right to petition, the election must be made with traverse. If the reply does not distinctly and specifically point out supposed errors in the restriction requirement, the election shall be treated as an election without traverse.

Should applicant traverse on the ground that the inventions or species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the inventions or species to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C.103 (a) of the other invention.

7. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the

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application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Any inquiry concerning this communication from the examiner should be directed to Wu-Cheng Winston Shen whose telephone number is (571) 272-3157 and Fax number is 571-273-3157. The examiner can normally be reached on Monday through Friday from 8:00 AM to 4:30 PM. If attempts to reach the examiner by telephone are unsuccessful, the supervisory patent examiner, Peter Paras, Jr. can be reached on (571) 272-4517. The fax number for TC 1600 is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Wu-Cheng Winston Shen/
Patent Examiner
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